

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the Matter of the Application of: Kazuhisa Misono

Serial No.: 10/599,063

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For: COMPUTER SYSTEM, SERVERS CONSTITUTING THE SAME, AND JOB
EXECUTION CONTROL METHOD AND PROGRAM THEREFOR

Examiner: Camquy Truong

Group Art Unit: 2195

Attorney Docket No.: JP920040033US1

Commissioner for Patents

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APPEAL BRIEF

Sir:

In response to the Office Action of , and in support of the Notice of Appeal file on
, Applicants respectfully submit this Appeal Brief.

(I) Real Party in Interest

The real party in interest for this Application is assignee INTERNATIONAL BUSINESS MACHINES CORPORATION of Armonk, NY.

(II). Related Appeals and Interferences

There are no related appeals or interferences.

(III). Status of Claims

Claims 1-16 are pending in the present application and each of claims 1-16 stand finally rejected.

(IV). Status of Amendments

No amendments have been made to the claims after the final rejection. There are no unentered amendments to the claims.

(V). Summary of claimed subject matter**(V.A) Claim 1**

Claims 1 is directed to a computer system (Page 1, lines 1-3; Page 3, lines 19-21; Page 5, lines 19-20) for performing grid computing with a plurality of computers connected through a network (Page 1, lines 1-3; Page 3, lines 19-21; Page 5, lines 19-20), the computer system comprising:

a center server **100** for requesting the plurality of computers on the network to execute a job (Page 5, lines 21-22); and

a process server **200**, which is one of the plurality of computers, for executing the job in response to a request from the center server (Page 5, lines 22-23);

wherein the center server comprises:

a scheduler section **110** which assigns the job to be executed to the process server and issues a job execution request (Page 6, lines 13-15); and

an agent section **120** which manages information about the process server (Page 7, lines 9-22), receives the job execution request issued by the scheduler section (Page 6, lines 33-35; Page 7, lines 23-24), and sends the job execution request to the process server to which the requested job has been assigned (Page 6, lines 31-33; Page 7, lines 25-26), in a manner selected to accommodate an access type of the process server (Page 9, lines 22-33).

(V.B) Claim 2

Claim 2 is directed to the computer system according to claim 1, wherein the system comprises a plurality of process servers **200** (Fig. 1 shows 4 process servers; Page 5; lines 21-24), and each of the plurality of process servers **200** is provided with a separate agent section **210** (Page 10, lines 28-31).

(V.C) Claim 4

Claim 4 is directed to the computer system according to claim 2, wherein the scheduler section **110** issues at least two job execution requests assigned to different process servers **200** (Page 10, lines 18-21), and at least one agent section **120** sends a first job execution request received from the scheduler section to the corresponding process server in response to polling access from the corresponding process server (Page 10 lines 2-9), and at least one second agent section **120** sends a second job execution request received from the scheduler section to the corresponding process server in a push type scheduling scheme at timing managed by the second agent section (Page 9, line 34- Page 10, line 1).

(V.D) Claim 6

Claim 6 is directed to a server **100** for scheduling jobs and requesting execution of the jobs in a grid computing system (Page 5, lines 19-23), the server comprising:

a processor **11** (Page 5, lines 30-31); and

a memory **13** operably connected to the processor **11** (Page 5, lines 31-32), and having encoded thereon instructions **110**, **120** (Page 6, lines 13-19) executable by the processor **11** (Page 6, lines 20-22), comprising:

a scheduler section **110** (Page 6, lines 13-14) which assigns a job of the jobs to be executed to a computer constituting the grid computing system (Page 6, lines 13-15) and requests the computer to execute the job (Page 6, lines 31-32); and

an agent section **120** (Page 6, lines 13-15) which manages information about the computer (Page 7, lines 9-22), receives the request for execution of the job by the scheduler section on behalf of the computer to which the job has been assigned (Page 6, lines 33-35; Page 7, lines 23-24), and provides a request for execution of the job to the computer (Page 6, lines 31-33; Page 7, lines 25-26), in a manner selected to accommodate an access type of the computer (Page 9, lines 22-33).

(V,E) Claim 8

Claim 8 is directed to the server according to claim 6, wherein the agent section **120** is provided for each of computers constituting the grid computing system (Page 8, line 2 – Page 10, line 9) and makes the request for execution of the job by using an individual communication scheme established between the agent section and a corresponding computer (Page 9, lines 16-19), and wherein a separate agent section is provided for each of the computers (Page 10, lines 28-31), the scheduler section issues at least at least one job execution request to each of at least two different computers (Page 10, lines 18-21), and at least a first one of the agent sections provides a request for execution of the corresponding job to a first one of the computers constituting the system in response to polling accesses from the first one of the computers (Page 10 lines 2-9), and at least a second one of the agent sections provides a request for execution of the corresponding job to a second one of the computers in a push scheduling scheme at timing managed by the agent sections (Page 9, line 34- Page 10, line 1).

(V.F) Claim 9

Claim 9 is directed to a server **100** for scheduling jobs and requesting execution of the jobs in a grid computing system (Page 5, lines 19-23), the server comprising:

a processor **11** (Page 5, lines 30-31); and

a memory **13** operably connected to the processor **11** (Page 5, lines 31-32), and having encoded thereon instructions **110**, **120** (Page 6, lines 13-19) executable by the processor **11** (Page 6, lines 20-22), comprising;

an agent section **120** (Page 6, lines 13-15) which manages information about capacity and operating status of a computer constituting the grid computing system (Page 7, lines 9-22), relays communication with the computer (Page 6, lines 31-35; Page 7, lines 23-26), and performs transmission and reception according to an access type of the computer (Page 9, lines 22-33); and

a scheduler section **110** (Page 6, lines 13-14) which assigns, on the basis of the information managed by the agent section, a job of the jobs to be executed by the computer (Page 6, lines 13-15), and requests the computer to which the job has been assigned to execute the job through the agent section (Page 9, lines 22-33).

(V.G) Claim 10

Claim 10 is directed to the server according to claim 9, wherein separate agent sections **120** are provided for each of computers **200** constituting the grid computing system (Page 10, lines 28-31), and the scheduler section **110** requests execution of the job through the agent section corresponding to the computer to which the job has been assigned (Page 6, lines 31-32).

(V.H) Claim 12

Claim 12 is directed to a job execution control method (Page, lines 1-3, Page 4, lines 7-9) using a computer to schedule jobs and request execution of the jobs in a grid computing system (Page 1, lines 1-3, Page 4, lines 7-9), comprising the steps of:

the computer assigning a job on the basis of capacity of a process server constituting the grid computing system (Page 4, lines 9-12; Page 6, lines 27-30), stored in a storage (Page 4, line 11; Page 7, lines 19-22), and executing a job of the jobs (Page 4 lines 12-15; Page 8, lines 27-28), regardless of the access type of the process server (Page 4, line 12; Page 9, lines 12-13);

the computer issuing a job execution request to the process server to which the job has been assigned (Page 4, lines 12-13; Page 6, lines 31-33; Page 9, lines 14-15); and

the computer holding temporarily the issued job execution request and sending the job execution request to the process server to which the job has been assigned (Page 4, lines 13-15; Page 9, lines 27-33), according to the access type of the process server (Page 4, line 15, Page 9, lines 22-33).

(V.D) Claim 13

Claim 13 is directed to a computer program product (Page 4, lines 16-21), comprising a computer readable non-transitory storage medium (Page 4, lines 19-21) having encoded thereon:

computer instructions for storing in recording means and managing information about a process server which constitutes a grid computing system (Page 4, line 11; Page 7, lines 19-22) and executes a job (Page 4 lines 12-15; Page 8, lines 27-28);

computer instructions for assigning the job to be executed to the process server on the basis of information about the process server (Page 4, lines 9-12; Page 6, lines 27-30) and issuing a job execution request (Page 4, lines 12-13; Page 6, lines 31-33; Page 9, lines 14-15); and

computer instructions for receiving the job execution request and sending a request to the process server to which the requested job has been assigned (Page 4, lines 13-15; Page 9, lines 27-33), in a manner selected to accommodate an access type of the process server (Page 4, line 15, Page 9, lines 22-33).

(V.J) Claim 15

Claim 15 is directed to the computer program product according to claim 13, wherein the computer instructions for sending the request to the process server cause the computer to send the request to at least a first one of a plurality of process servers in response to polling accesses from the process servers (Page 10 lines 2-9), and send the request to at least a second one of a plurality of process servers at timing managed by the computer (Page 9, line 34- Page 10, line 1).

(V.K) Corresponding Structure for Means of Claim 13

The structure corresponding to recording means of claim 13 comprise: a magnetic disk, optical disk, and semiconductor memory (Page 4, lines 18-20), and their equivalents.

(VI). Grounds of Rejection to be reviewed on appeal

Each of claims 1, 3, 6-7, 9, and 13 is rejected under 35 U.S.C. 103 as being obvious over U.S. Patent No. 6,098,091 to Kisor (hereafter "Kisor") in view of U.S. Patent Publication 2004/0230661 to Rashid et al. (hereafter "Rashid"). Each of claims 2, 4, 8, 10-11, and 14-15 is rejected under 35 USC 103 as being obvious over Kisor and Rashid in further view of U.S. Patent Publication 2002/0198924 to Akashi et al. (hereafter "Akashi"). Claim 5 is rejected under 35 USC 103 as being obvious over Kisor, Rashid, and Akashi in further view of U.S. Patent Publication 2002/0198924 to Aziz et al. (hereafter "Aziz"). Claim 12 is rejected under 35 USC 103 as being obvious over Akashi and Rashid. Claim 16 is rejected under 35 USC 103 as being obvious over Kisor, Rashid, and Aziz.

The questions for appeal are whether or not each of independent claims 1, 6, 9, 12, and 13 claims 1-14 is obvious over any combination of Kisor, Rashid, Akashi, and

Aziz, and whether or not each of dependent claims 2, 4, 8, 10, and 15 are obvious over any combination of Kisor, Rashid, Akashi, and Aziz, independent of their respective parent claims.

(VII). Argument**(VII.A) Principles of Law Relating to Obviousness**

Under 35 USC 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or nonobviousness of the subject matter is determined. *Graham v. John Deere Co.* 383 US 1 (1966). When the prior art teaches away from combining certain known elements, discovery of a successful means of combining them is more likely to be nonobvious *KSR Int'l Co. v. Teleflex Inc.* 550 U.S. ____ (2007) citing *United States v. Adams* 383 US 39, 0 (1966). A court must ask whether the improvement is more than the predictable use of prior art elements according to established functions. *KSR Int'l Co/ v. Teleflex Inc.* 550 U.S. ____ (2007).

(VII.B) Rejection of Claims 1, 6, 9, and 13 under 35 USC 103 over Kisor and Rashid

Claims 1, 6, 9, and 13 are allowable because they include features that are neither disclosed nor suggested by Kisor, Rashid, or any other references, either individually or in combination.

(VII.B.1) *sending a job request "in a manner selected to accommodate an access type of the process server"*

Claims 1, 6, 9, and 13 are allowable, because they include the feature, sending a job request "in a manner selected to accommodate an access type of the process server".

As described in the present application, the server can send a job request to either a push-type or a pull-type process server within the same grid computing network.

The Examiner acknowledges that Kisor neither discloses nor suggests this feature ("Kisor does not explicitly teach sends the job execution request to process server in a

manner selected to accommodate an access type of the process server” (sic), Office Action of March 28, 2011 at Paragraph 4, lines 28-29).

However, the Examiner concludes in error that this feature is disclosed by Rashid (Office Action of March 28, 2011 at Paragraph 4, lines 29-34 “Rashid teaches sends the job execution request to process server in a manner selected to accommodate an access type of the process server” quoting Rashid at paragraph [0034]). Rashid Provides, at paragraph [0034]:

If a notification is detected by the application, either in push operation step (303) or in poll operation step (307), the application proceeds to step (306) in which a notification handler is selected to process the notification message, based on the notification type, which may for instance be, but is not limited to a text message or a Uniform Resource Locator (URL). If the notification is a text or text box message, the handler selected may for instance be a pop-up dialog to display the message, whereas, if the notification is a URL, the notification handler selected may for instance be a Microsoft Pocket Internet Explorer Browser.

Rashid is directed to a rules-based notification system (RBN) on a client-server network. In Rashid, the server does not send job requests, but rather notification messages. Moreover, as plainly stated in Rashid at paragraph [0034], Rashid selects a notification handler (i.e., one of a variety of communication applications, such as a dialog box or browser), not a method for sending a job request, such as a push-type or polling-type. Also, as clearly stated in Rashid, the selection of a handler is based on the type of message, not on the type of process server to which a job request is being sent, as in the present application.

Accordingly, the Examiner has failed to make a prima facie case of obviousness for the feature of sending a job request “in a manner selected to accommodate an access type of the process server”.

(VII.C) Rejection of Claim 12 under 35 USC 103 over Akashi and Rashid

Claim 12 is allowable, because it includes features that are neither disclosed nor suggested by Akashi, Rashid, or any other references, either individually or in combination.

(VILC.1) sending a job request “according to the access type of the process server”

Claim 12 is allowable, because it includes the feature, sending a job request “according to the access type of the process server”.

The Examiner acknowledges that this feature is neither disclosed nor suggested by Akashi (“Akashi does not explicitly teach sending the job execution requests to the process server to which the job has been assigned, depending on to the access type of the process server” Office Action of March 28, 2011 Paragraph 23, lines 28-30).

However the Examiner concludes in error that this feature is disclosed by Rashid (Office Action of March 28, 2011 at Paragraph 23, lines 30-37). For the reasons presented for the related feature, sending a job request “in a manner selected to accommodate an access type of the process server”, Rashid does not disclose or suggest this feature.

Accordingly, the Examiner has failed to make a prima facie case of obviousness for the feature of sending a job request “according to the access type of the process server”.

(VILD) Rejection of Claims 2, 8, and 10 under 35 USC 103 over Kisor, Rashid, and Akashi

Claims 2, 8, and 10 are allowable because they include features that are neither disclosed nor suggested by Kisor, Rashid, Akashi, or any other references, either individually or in combination.

(VII.D.1) “each of the plurality of process servers is provided with a separate agent section”

Claims 1, 6, 9, and 13 are allowable, because they include the feature, “each of the plurality of process servers is provided with a separate agent section”. As explained in the present application at page 10, lines 28-36, separate agent sections (in the center server **100** allow for easy configuration change when adding or removing a process server. Moreover, the separate agent sections can readily accommodate process servers with different access types in the same grid computing network, because each agent accesses its corresponding process server in the appropriate access type.

The Examiner acknowledges that Kisor and Rashid do not disclose or suggest this feature (“Kisor and Mohamed (sic, Rashid) do not explicitly teach plurality of process servers and each of the plurality of process servers is provided with a separate agent section the agent section (sic)”, Office Action of March 28, 2011 at Paragraph 11, lines 1-3).

However, the Examiner concludes in error that this feature is disclosed by Akashi (“Akashi teaches the system comprises a plurality of process servers and each of the plurality of process servers is provided with a separate agent section the agent section (sic) (Fig. 1 shows each computer 110-1 to 110-m has associated cluster scheduler).

In Akashi, as shown in Fig. 1, a cluster scheduler is provided on each computer. However, a cluster scheduler is a scheduler and not an agent (it provides scheduling, not retrieval and management of process server data and communication with the process server from the central server.

Moreover, the cluster schedulers of Akashi are provided in the process servers, not in the central server as provided in the present application. See claim 1 : “the center server comprises: ... an agent section...” In the present application, separate agent

sections corresponding to each process server are provided in the central server, not in the process servers.

Accordingly, the Examiner has failed to make a prima facie case of obviousness for the feature “each of the plurality of process servers is provided with a separate agent section”.

(VII.E) Rejection of Claims 4 and 15 under 35 USC 103 over Kisor, Rashid, and Akashi

Claims 2, 8, and 10 are allowable because they include features that are neither disclosed nor suggested by Kisor, Rashid, Akashi, or any other references, either individually or in combination.

(VII.E.1) at least one agent section sends a first job execution request received from the scheduler section to the corresponding process server in response to polling access from the corresponding process server, and at least one second agent section sends a second job execution request received from the scheduler section to the corresponding process server in a push type scheduling scheme at timing managed by the second agent section

Claims 4 and 15 are allowable, because they include the feature, at least one agent section sends a first job execution request received from the scheduler section to the corresponding process server in response to polling access from the corresponding process server, and at least one second agent section sends a second job execution request received from the scheduler section to the corresponding process server in a push type scheduling scheme at timing managed by the second agent section.

The Examiner concludes in error that because Kisor provides an agent section that sends a job request in response to polling access and Akashi provides an agent that sends a job execution request to the corresponding process server in a push type scheduling scheme, that the present feature is an obvious modification or combination of these references. However, neither reference discloses or suggests two different agent sections communicating with corresponding process servers in two different methods. It is the

accommodation of both methods in the same grid computing system that is novel, not one or the other.

Accordingly, the Examiner has failed to make a prima facie case of obviousness for the feature, at least one agent section sends a first job execution request received from the scheduler section to the corresponding process server in response to polling access from the corresponding process server, and at least one second agent section sends a second job execution request received from the scheduler section to the corresponding process server in a push type scheduling scheme at timing managed by the second agent section.

For the reasons presented above, Applicant respectfully requests that the Board reverse the Examiner and allow claims 1-16.

Respectfully Submitted,



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(VIII) Claims Appendix**Listing of Claims**

1. A computer system for performing grid computing with a plurality of computers connected through a network, the computer system comprising:

a center server for requesting the plurality of computers on the network to execute a job; and

a process server, which is one of the plurality of computers, for executing the job in response to a request from the center server;

wherein the center server comprises:

a scheduler section which assigns the job to be executed to the process server and issues a job execution request; and

an agent section which manages information about the process server, receives the job execution request issued by the scheduler section, and sends the job execution request to the process server to which the requested job has been assigned, in a manner selected to accommodate an access type of the process server.

2. The computer system according to claim 1, wherein the system comprises a plurality of process servers, and each of the plurality of process servers is provided with a separate agent section.

3. The computer system according to claim 1, wherein the agent section obtains information about the capacity and operating status of the process server corresponding to the agent section from the process server and manages the information, and the scheduler section assigns the job to the process server on the basis of the information managed by the agent section.

4. The computer system according to claim 2, wherein the scheduler section issues at least two job execution requests assigned to different process servers, and at least one agent section sends a first job execution request received from the scheduler section to the corresponding process server in response to polling access from the corresponding

process server, and at least one second agent section sends a second job execution request received from the scheduler section to the corresponding process server in a push type scheduling scheme at timing managed by the second agent section.

5. The computer system according to claim 2, wherein at least some of the process servers are connected to the center server through a firewall; and
the agent sections corresponding to said process servers send the request received from the scheduler section to the process servers connected through the fire wall in response to polling accesses from the process servers.

6. A server for scheduling jobs and requesting execution of the jobs in a grid computing system, the server comprising:
a processor; and
a memory operably connected to the processor, and having encoded thereon instructions executable by the processor, comprising:
a scheduler section which assigns a job of the jobs to be executed to a computer constituting the grid computing system and requests the computer to execute the job; and
an agent section which manages information about the computer, receives the request for execution of the job by the scheduler section on behalf of the computer to which the job has been assigned, and provides a request for execution of the job to the computer, in a manner selected to accommodate an access type of the computer.

7. The server according to claim 6, wherein the agent section is provided for each of computers constituting the grid computing system and makes the request for execution of the job by using an individual communication scheme established between the agent section and a corresponding computer.

8. The server according to claim 7, wherein a separate agent section is provided for each of the computers, the scheduler section issues at least at least one job execution request to each of at least two different computers, and at least a first one of the agent sections provides a request for execution of the corresponding job to a first one of the

computers constituting the system in response to polling accesses from the first one of the computers, and at least a second one of the agent sections provides a request for execution of the corresponding job to a second one of the computers in a push scheduling scheme at timing managed by the agent sections.

9. A server for scheduling jobs and requesting execution of the jobs in a grid computing system, the server comprising:

a processor; and

a memory operably connected to the processor, and having encoded thereon instructions executable by the processor, comprising;

an agent section which manages information about capacity and operating status of a computer constituting the grid computing system, relays communication with the computer, and performs transmission and reception according to an access type of the computer; and

a scheduler section which assigns, on the basis of the information managed by the agent section, a job of the jobs to be executed by the computer, and requests the computer to which the job has been assigned to execute the job through the agent section.

10. The server according to claim 9, wherein separate agent sections are provided for each of computers constituting the grid computing system, and the scheduler section requests execution of the job through the agent section corresponding to the computer to which the job has been assigned.

11. The server according to claim 9, wherein the scheduler section assigns the job on the basis of information about the capacity of the computer stored in the agent section and makes the request for execution of the job regardless of an access type of the computer to which the job has been assigned, and the agent section sends a request for execution of the job issued by the scheduler section to at least a first one of the computers in response to polling accesses from the computers, and sends a request for execution of the job issued by the scheduler section to at least a second one of the other computers in a push scheduling scheme at timing managed by the agent section.

12. A job execution control method using a computer to schedule jobs and request execution of the jobs in a grid computing system, comprising the steps of:

the computer assigning a job on the basis of capacity of a process server constituting the grid computing system, stored in a storage, and executing a job of the jobs, regardless of the access type of the process server;

the computer issuing a job execution request to the process server to which the job has been assigned; and

the computer holding temporarily the issued job execution request and sending the job execution request to the process server to which the job has been assigned, according to the access type of the process server.

13. A computer program product, comprising a computer readable non-transitory storage medium having encoded thereon:

computer instructions for storing in recording means and managing information about a process server which constitutes a grid computing system and executes a job;

computer instructions for assigning the job to be executed to the process server on the basis of information about the process server and issuing a job execution request; and

computer instructions for receiving the job execution request and sending a request to the process server to which the requested job has been assigned, in a manner selected to accommodate an access type of the process server.

14. The computer program product according to claim 13, wherein the computer instructions for sending a request to the process server send the request regardless of an operating status of the process server.

15. The computer program product according to claim 13, wherein the computer instructions for sending the request to the process server cause the computer to send the request to at least a first one of a plurality of process servers in response to polling accesses from the process servers, and send the request to at least a second one of a plurality of process servers at timing managed by the computer.

16. The computer program product according to claim 13, wherein the computer instructions for sending the request to the process server cause the computer to send the request received from a scheduler section to the process server connected to the computer through a firewall in response to a polling access from the process server.

(IX). Evidence appendix

No extrinsic evidence is presented.

(X). Related proceedings appendix

There are no related proceedings.